

Amendments to the Claims

1 (currently amended). A polymer incarcerated Lewis acid metal catalyst comprising a Lewis acid metal and a crosslinked polymer, wherein the Lewis acid metal is incarcerated in the a crosslinked polymer, wherein the crosslinked polymer is obtained by crosslinking crosslinking groups contained in a crosslinkable polymer which has hydrophilic substituents containing crosslinking groups linked directly to the crosslinkable polymer main chain and, the crosslinkable polymer contains at least one type of monomer unit having a hydrophobic substituents linked directly to the crosslinkable polymer main chain, substituent and a hydrophilic substituent having the crosslinking group, and wherein the hydrophobic substituents do not contain hydrophilic groups or crosslinking groups, and further wherein the crosslinkable polymer contains at least one type of monomer unit containing (a) an aromatic hydrophobic substituent which does not contain hydrophilic groups or crosslinking groups and (b) a hydrophilic substituent containing a crosslinking group.

2 (currently amended). The catalyst of claim 1, wherein the crosslinkable polymer further contains comprises at least one type of monomer unit containing a hydrophobic substituent but no and a hydrophilic substituent containing a crosslinking group and a monomer unit containing a hydrophobic substituent.

3 (currently amended). The catalyst of claim 2, wherein the crosslinkable polymer comprises further contains at least one type of a monomer unit containing an aromatic substituent and a hydrophilic substituent containing a crosslinking group, a monomer unit containing a hydrophobic substituent other than an aromatic substituent and a hydrophilic substituent containing a crosslinking group, and a monomer unit containing a hydrophobic substituent but no hydrophilic substituent containing a crosslinking group.

4 (currently amended). The catalyst of claim 1, wherein the crosslinkable polymer contains comprises a monomer unit containing a hydrophilic substituent containing an

epoxy group and a monomer unit containing a hydrophilic substituent containing a group that reacts with the epoxy group.

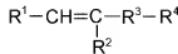
5 (currently amended). The catalyst of claim 4, wherein the crosslinkable polymer ~~comprises~~ contains a monomer unit containing an aromatic substituent and a hydrophilic substituent containing an epoxy group, a monomer unit containing an aromatic substituent and a hydrophilic substituent containing a group that reacts with the epoxy group, and a monomer unit containing a hydrophobic substituent ~~but no hydrophilic substituent containing a crosslinking group~~.

6 (currently amended). The catalyst of claim 4, wherein the crosslinkable polymer ~~comprises~~ contains a monomer unit containing an aromatic substituent and a hydrophilic substituent containing an epoxy group, a monomer unit containing a hydrophobic substituent other than an aromatic substituent and a hydrophilic substituent containing a group that reacts with the epoxy group and a monomer unit containing a hydrophobic substituent ~~but no hydrophilic substituent containing a crosslinking group~~.

7 (currently amended). The catalyst of claim 4, wherein the crosslinkable polymer ~~comprises~~ contains a monomer unit containing an aromatic substituent and a hydrophilic substituent containing a group that reacts with an epoxy group, a monomer unit containing a hydrophobic substituent other than an aromatic substituent and a hydrophilic substituent containing an epoxy group and a monomer unit containing a hydrophobic substituent ~~but no hydrophilic substituent containing a crosslinking group~~.

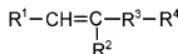
8 (previously presented). The catalyst of claim 4, wherein the group that reacts with an epoxy group is at least one selected from a group comprising a hydroxyl group, an amino group, a thiol group and a carboxyl group.

9 (original). The polymer incarcerated Lewis acid metal catalyst of claim 1, wherein the crosslinkable polymer is obtained by polymerizing, as main monomers, a styrene monomer, a vinyl monomer represented by the general formula



, wherein R¹ represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, R² represents a hydrogen atom, an alkyl group having 1 to 8 carbon atoms or an aryl group containing less than 14 carbon atoms, R³ represents an alkylene group having 1 to 6 carbon atoms, -(CH₂)_n(OCH₂CHR⁵)_m-, -(CH₂)_n(OCH₂C=O)_m- or -(CH₂)_n(COCH₂)_m-, wherein R⁵ represents a hydrogen atom or a methyl group and n and m each independently represent integers 1 to 10, and R⁴ represents an epoxy group,

and a vinyl monomer represented by the general formula



, wherein R¹ to R³ and n and m independently represent the same as above, and R⁴ represents at least one reactive group selected from a group comprising a hydroxyl group, an amino group, a thiol group and a carboxyl group.

10 (previously presented). The catalyst of claim 1 prepared by mixing an organic solution containing the crosslinkable polymer and the Lewis acid metal to prepare a polymer micelle incarcerating Lewis acid metal, and crosslinking the polymer micelle incarcerating Lewis acid metal.

11 (previously presented). The catalyst of claim 1, wherein the Lewis acid metal is represented by MY_n, wherein M represents Cu, Zn, Fe, Sc or a lanthanoid element, Y represents a halogen atom, OAc, OCOCF₃, ClO₄, SbF₆, PF₆ or OSO₂CF₃ and n is 2 or 3.

12 (previously presented). An aldol, cyanolation, allylation, Michael, Mannich, Diels Alder or Friedel Craft reaction conducted in the presence of the catalyst of claim 1.

13 (currently amended). The catalyst of claim 2, wherein the crosslinkable polymer contains comprises a monomer unit containing a hydrophilic substituent containing an epoxy group and a monomer unit containing a hydrophilic substituent containing a group that reacts with the epoxy group.

14 (currently amended). The catalyst of claim 3, wherein the crosslinkable polymer contains comprises a monomer unit containing a hydrophilic substituent containing an epoxy group and a monomer unit containing a hydrophilic substituent containing a group that reacts with the epoxy group.

15 (previously presented). The catalyst of claim 9 prepared by mixing an organic solution containing the crosslinkable polymer and the Lewis acid metal to prepare a polymer micelle incarcerating Lewis acid metal, and crosslinking the polymer micelle incarcerating Lewis acid metal.

16 (previously presented). The catalyst of claim 9, wherein the Lewis acid metal is represented by MY_n , wherein M represents Cu, Zn, Fe, Sc or a lanthanoid element, Y represents a halogen atom, OAc, OCOCF₃, ClO₄, SbF₆, PF₆ or OSO₂CF₃ and n is 2 or 3.

17 (previously presented). The catalyst of claim 10, wherein the Lewis acid metal is represented by MY_n , wherein M represents Cu, Zn, Fe, Sc or a lanthanoid element, Y represents a halogen atom, OAc, OCOCF₃, ClO₄, SbF₆, PF₆ or OSO₂CF₃ and n is 2 or 3.

18 (previously presented). An aldol, cyanolation, allylation, Michael, Mannich, Diels Alder or Friedel Craft reaction conducted in the presence of the catalyst of claim 9.

19 (previously presented). An aldol, cyanolation, allylation, Michael, Mannich, Diels Alder or Friedel Craft reaction conducted in the presence of the catalyst of claim 10.